REVIEW COMMENTS AND RESPONSES

Draft Final Feasibility Study, Quendall Terminals Site,

RESPONDENTS' RESPONSE DATE: November, 06 2015

EPA ITEM	SECT/PARA	EPA COMMENT	PRP ISSUE/RESPONSE (NOVEMBER 2014)	EPA FOLLOW-UP RESPONSE (JULY 2015)	PRP ISSUE/RESPONSE (NOVEMBER 2015)
1	Disapproval of Section 7	**EPA Disapproves Section 7 of the Draft FS.** EPA is disapproving Section 7 of the Respondents' draft final FS, dated October 14, 2013 for the reasons described in Items 2 and 3, below.			Per August 27, 2015 meeting, EPA has revised this comment to be 'approved with comments'. The Final FS incorporates EPA's October 2014 version of Section 7 with revisions based on subsequent discussions with EPA and as noted below.
2	Disapproval of Section 7	**Failure to evaluate individual alternatives appropriately and according to EPA NCP rules and RI/FS guidance.** For example: a) **Overall Protection of Human Health and the Environment.** This evaluation criterion provides a final check to assess whether each alternative provides adequate protection of human health and the environment. The overall assessment of protection draws on the assessments conducted under other evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs. i. The Respondents failed to completely consider all aspects of the criterion "Overall Protectiveness…" as described in the NCP and EPA guidance. The Respondents only evaluated whether an alternative met each RAO and neglected considering long-term and short-term effectiveness and whether all ARARs were met or not. EPA, by including these other factors into the evaluation of Overall Protectiveness, the Agency determined that Alternatives 1 through 6 cannot satisfy the criterion "Overall Protectiveness of Human Health and the Environment". Additionally, **EPA concluded that Alternatives 7 through 10 could satisfy the criterion, "Overall Protectiveness" because either one or more MCLs would be met throughout most of the plume, if not all of it. In cases where MCLs could not be met, a Technical Impracticability waiver would likely be granted.** b. **Compliance with ARARs.** The criterion to comply with ARARs or obtain a waiver should be individually evaluated for each alternative and also addressed in the comparative evaluation of alternatives in the appropriate locations sin the discussions. i. **The Respondents consistently ignored acknowledging that MCLs could be met for one or more of the Indicator COCs in various locations of the groundwater plume before a 100 years passed.** EPA has explained a number of times, compliance with ARARs is made on a COC basis by media and to the extent practicable. The Respondents own modeling results indicate that Alternatives 8 and 10 could result in restoration of	RE: EPA Comment Item 2.a See PRP Response No. 34 (page 29 in this table) to *Page ES-12, Overall Protection of Human Health and the Environment Summary* below. Meeting the MCL ARAR or obtaining a Technical Impracticability waiver should not be a requirement for meeting the "Overall Protectiveness" criterion.	RE: EPA Comment Item 2.a In the December 3, 2014 meeting, EPA agreed to provide an additional response regarding this issue. This response is intended to cover this issue and the Respondents' other comments related to evaluation of the alternatives against the threshold criteria. Upon further review, EPA agrees that all of the proposed alternatives (except Alternative 1) would satisfy the criterion for "Overall Protectiveness". As such, all alternatives will be included in the comparative analysis. Meeting the MCL ARAR may be assessed similarly to what was presented in the DFFS, emphasizing that alternatives that treat or remove all known PTWs have significantly greater effect on plume reduction than those that leave known quantities of PTW behind. Statements regarding whether or not a TI waiver would likely be granted may be removed. EPA will require that the Respondents provide a pre-final review copy of the FS that contains Section 1 through 7	RE: EPA Comment Item 2.a Alternatives 2 through 6 have been identified as satisfying the overall protectiveness criterion and have been included in the comparative analysis in Section 8. The discussions of meeting the MCL ARAR include the relative effect of each remedy on plume reduction. Statements regarding the likelihood of obtaining a TI waiver have been removed. As identified in EPA's letter dated September 28, 2015, the pre-final review copy of the FS submitted to EPA includes Sections 1 through 8.

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		groundwater to the MCL for benzene. Additionally, the Respondents results also show that the plume exceeding MCLs can be dramatically reduced by Alternatives 7 through 10 and for the portions of groundwater that exceeded MCLs, a TI waiver could be granted. A TI waiver and/or compliance with MCLs would be sufficient to fully comply with the threshold criteria regarding compliance with ARARs. c. **Long-term Effectiveness and Permanence.** The RI/FS Guidance states "(t)he primary focus of this evaluation is the extent and effectiveness of the controls that may be required to manage the risk posed by treatment residuals and/or untreated wastes. The following components of the criterion should be addressed for each alternative: i. Magnitude or residual risk – This factor assesses the residual risk remaining from untreated waste or treatment residuals at the conclusion of remedial activities…" ii. Adequacy and reliability of controls – "(t)his factor assesses the adequacy and suitability of controls, if any, that are used to manage treatment residuals or untreated wastes that remain at the site." **The Respondents evaluation for each alternative only focused on whether source control RAOs were met or not and the mechanism for controlling contamination left in place by describing various engineering controls. There is no discussion about the potential risk of the contamination left on-site. EPA revised the discussion of this criterion in Section 7 to discuss risk by presenting quantitative measures "of the volume or concentration of contaminants in waste, media, or treatment residuals remaining on the site" in accordance with guidance.** Additionally, the Respondents discussion of controls was superficial, lacking in any specifics such as the fact that ICs aimed at protecting aquatic remedial actions are unenforceable or that there is little information and field experience regarding the long-term effectiveness of RCM caps.		of the text prior to submittal of Section 8 (Comparative Analysis of Alternatives).	
			RE: EPA Comment Item 2.b This statement is incorrect. Sections 7.9.1, 7.9.2.1, 7.11.1, 7.11.2.1, and 8.2 of the DFFS all discuss Indicator COCs that are predicted to achieve MCLs in less than 100 years. Furthermore, the reduction in area (i.e., locations where MCLs may be met) is a significant factor in the DFFS evaluation for all alternatives.	RE: EPA Comment Item 2.b Respondents' comments are noted.	RE: EPA Comment Item 2.b No revisions were made regarding this comment.

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			RE: EPA Comment Item 2.b This statement is untrue. The DFFS provides extensive analysis of potential risk and includes consideration of not just the volume and concentration of contaminants, but also their location and risk for release or future exposure. See the detailed evaluation of each alternative (Sections 7.3.3.1, 7.4.3.1, etc.) and the comparative evaluation (Section 8.3.1) of the DFFS. The EPA's analysis treats all DNAPL as having the same residual risk. The EPA's analysis is deficient because it ignores the variability in residual risk resulting from contamination in different locations and with different mobility characteristics.	RE: EPA Comment Item 2.b In the December 3, 2014 meeting, EPA agreed to provide an additional response regarding this issue. EPA stands on its definition of oil-wetted or oil-coated soil or sediment as PTW, which is to be addressed consistently (see PRP Response No. 41). Differing locations (e.g., depth) and mobility may influence prioritizing interim actions but a final remedy must address all PTW unless technically impracticable.	RE: EPA Comment Item 2.b For the purposes of the FS, all oil-wetted or oil-coated soil or sediment is assumed to be PTW. The range of alternatives were constructed to prioritize treatment or removal of PTWs in certain areas. Potentially mobile DNAPL near the lake exhibits a greater risk to the lake than DNAPL further upland. A discussion regarding differentiating factors of DNAPL for the purpose of developing a range of remedial alternatives has been added to Section 4.4.1.8. Note that the FS does not differentiate actions that may be taken under interim and final remedies.
3	Disapproval of Section 7	**Biased Assessment of Remedial Technologies.** EPA is also disapproving Section 7 because certain aspects of the evaluation of alternatives were based on several overarching assumptions that resulted in biased evaluations. For example: a) Respondents use the assumption that generation of residuals associated with dredging or excavation are such a disadvantage that any alternative that is removal-based cannot achieve the best balance of pros and cons to justify selection of primarily removal based alternative. For example: i. Respondents discuss at great length the contention that dredging causes unacceptable levels of residuals. EPA acknowledges that residuals especially residuals associated with DNAPL are particularly troublesome. EPA has also made this comment in our comments on the draft FS. The Respondents reference source information that is considered dated at this point. Since that time, there have been advances in dredging technology. In fact, some recent cleanup	RE: EPA Comment Item 3 Section 7 of the DFFS includes discussion of impacts regarding capping (Figure 7-4), describes impacts from both dredging and capping, and acknowledges that BMPs can be used to control impacts. We strongly disagree with the EPA's contention that the DFFS precludes alternatives that include source removal. Source removal, including sediment dredging, is a significant component of the remedy that Respondents	RE: EPA Comment Item 3 Respondents' comments are noted. Respondents may revise discussions regarding the effectiveness of BMPs for mitigating construction impacts and controlling residuals, which EPA will review prior to finalizing the FS.	RE: EPA Comment Item 3 Statements regarding BMP effectiveness, including clarifications that residuals will be managed but are not expected to be eliminated, have been included in the Final FS.

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		dredge projects have achieved cleanup numbers on dredged surfaces without incorporating the use of thin sand covers over residual contaminated surfaces. ii. Respondents failed to acknowledge a number of troublesome issues about the use of capping on contaminated sediments. Aside from the fact, that alternatives that rely heavily on the use of aquatic caps, in perpetuity, can be eroded or damaged will require monitoring and maintenance "forever". A cap that fails because it erodes or is damaged can release contamination for a long time before it is noticed. Whether these releases are not as significant or maybe more significant than dredge residuals is unknowable. iii. Respondents propose the use of some recently developed technologies, amended caps and RCM caps, where there is no field data or experience regarding the long-term use and effectiveness of reactive caps. They show promise however, the many concerns about their reliability was not addressed, such as at Quendall where nearshore bathymetry must be maintained, and if a RCM cap was installed, how is it replaced or repaired without causing releases or badly damaging the habitat. b) However, as noted, residuals can be a result of dredging but Respondents cannot automatically assume that residuals will cause a failure to meet cleanup numbers with today's technology and practices. Respondents fail to pay equal attention to the problems associated with alternatives that rely on ICs, in addition to capping, for remedial protectiveness and reliability. More can be done to prevent exposure to dredge residuals than to ensure the enforcement of ICs.	proposed as having the best balance of tradeoffs (new Alternative 4a). Advances in sediment dredging technology were incorporated as described in PRP Response No. 5 to EPA Comment Item 3.a.i below. On the contrary, we believe that EPA's analysis is highly biased toward full removal/treatment alternatives without providing a technical basis for this apparent bias. Their analysis understates the potential impacts of the large-scale removals proposed in Alternatives 7 through 10 by assuming that BMPs will be adequate to mitigate all impacts, and overstates the ability to control residuals (see PRP Response No. 5 to EPA Comment Item 3.a.i below). We strongly disagree with the EPA's assumption regarding the potential for residuals, based on the subsurface complexities of the Site. The EPA's analysis of alternatives is predicated on the potential for Alternatives 7 through 10 to achieve MCLs in groundwater, but no technical justification or relevant case studies (i.e., dredging at coal tar/creosote sites) are provided.		
			<u>RE: EPA Comment Item 3.a.i</u> The DFFS alternatives include consideration of advances in technology, for example the SedVac technology for dredging DNAPL-containing sediments. This technology is more recent than the mechanical environmental bucket technology the EPA has added, and more	<u>RE: EPA Comment Item 3.a.i</u> Respondents' comments are noted and EPA agrees to strike this comment and the revision to Section 7.5.5.3.	<u>RE: EPA Comment Item 3.a.i</u> Language has been revised as indicated.

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			applicable and protective for the shallow DNAPL in the TD area. We requested information from Shawn Blocker on the EPA's "recent cleanup dredge projects [that] have achieved cleanup numbers on dredged surfaces without incorporating the use of thin sand covers over residual contaminated surfaces" but no information was provided. The Boeing Plant 2 and Todd Shipyard case studies are not relevant since they did not include dredging of NAPL or, more specifically, coal tar DNAPL. Section 7.5.5.3 of the DFFS states: *Based on detailed studies performed at a range of environmental dredging sites which included silt curtains or similar technologies, approximately 2 to 4 percent of the mass of hydrophobic contaminants such as cPAHs that are dredged are released into the water column, with most of the release being in the bioavailable dissolved form (Bridges et al. 2010)*. We disagree that a 2010 reference should be considered 'dated'. Also note that EPA has deleted the above statement and replaced it with: *As discussed in Appendix C, Section C5.3.2, studies have concluded that a small percentage of the solids excavated or dredged during the last dredge production cut may accumulate as a post-dredge residual layer*. It is inconsistent to replace a water		

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			column release reference with a sediment residual reference. We disagree with this revision to the text.		
			RE: EPA Comment Item 3.a.ii Issues related to long-term monitoring and maintenance of caps were considered in the DFFS evaluation. The EPA's added statement: A cap that fails because it erodes or is damaged can release contamination for a long time before it is noticed is not relevant since there is no current DNAPL seepage observed in the existing (uncapped) condition. Note that the Respondent's preferred remedy includes dredging of all shallow DNAPL and capping of areas where DNAPL is deep and isolated by existing sediment.	RE: EPA Comment Item 3 a.ii EPA stands by the added statement. During oversight of the September 9, 2014 shoreline assessment by Grette Associates, sheens were observed in the water north of the T-dock. Bubbles of product floating to the surface were also observed as the team walked through the water. EPA will provide Respondents with photos showing the sheens.	RE: EPA Comment Item 3 a.ii EPA's added statement has been retained.
			RE: EPA Comment Item 3 a.iii Field data on the long-term effectiveness of RCM caps is accumulating. The EPA Region 10-approved remedy at the McCormick and Baxter site has both bulk organoclay and RCM caps spanning 23 acres that were installed in 2004. Extensive laboratory and field testing in 2006 and 2008 confirmed that both caps are performing as designed (Blischke and Olsta, 2009). These capping technologies have widespread usage, as discussed in Appendix C of the	RE: EPA Comment Item 3.a.iii Respondents' comments are noted. Note that during the December 3, 2014 meeting, EPA agreed that in the Final FS, amended sand caps could be included for alternatives that proposed RCM caps in the nearshore area, and that RCM caps could still be used for alternatives that proposed them for T-Dock sediment. Respondents may revise discussion of RCM caps in the context that RCM caps could	RE: EPA Comment Item 3.a.iii As discussed with EPA in the August 27, 2015 meeting, RCM caps have been incorporated into Alternatives 2 through 6 for DNAPL Areas not dredged, with the exception of DA-6 which is addressed with an amended sand cap.

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			DFFS. In Section 7.5.3.2, the EPA added the statement: *Mixing reactive material with capping media is an evolving technology and is expected to be used successfully in the future*. This statement is not relevant since RCM placement without release of DNAPL has been demonstrated as described in Appendix C, and EPA Comment Item 121 indicates EPA had no comments on Appendix C. EPA's comments and text rewrites (e.g., rating implementability low for Alternative 3) expresses a bias against capping, particularly RCM caps, which is inappropriate for an FS that is intended to objectively evaluate a range of remedial options. As described above, capping has been evaluated and successfully implemented at numerous sites and should be considered a highly implementable technology.	still be used for alternatives that proposed them for T-Dock sediment. EPA will review revisions prior to finalizing the FS. Ratings modifications are addressed in PRP Response No. 48.	
			<u>RE: EPA Comment Item 3.b</u> The DFFS discusses limitations due to ICs. Note that the EPA's rewrite of Section 7 acknowledges that long-term monitoring and ICs in both the upland and aquatic areas will be needed in perpetuity to ensure effectiveness for Alternatives 7 through 10 (see Section 7.9.4.3). Yet the EPA's analysis is heavily biased against Alternatives 2 through 6 based on the EPA's perception of the uncertainty in enforcing and maintaining ICs,	<u>RE: EPA Comment Item 3.b</u> Respondents' comments are noted. EPA agrees that ICs will be necessary to some degree for all of the alternatives, but maintains that **ICs are more reliably enforceable in the uplands as compared with the aquatic environment.** The Respondents may change the language under Administrative Feasibility for Alternative 2, Section 7.3.6.2 ("However, many of the institutional controls intended to protect aquatic remedial	<u>RE: EPA Comment Item 3.b</u> Language has been revised as indicated.

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			even though all ICs discussed have been commonly implemented at similar sites.	technologies are unenforceable") to be consistent with the **bold** statement above. Ratings modifications are addressed in PRP Response No. 48.	
4	Disapproval of Section 8	**EPA Disapproves Section 8 of the Draft FS.** EPA is disapproving Section 8 of Respondents' draft final FS, dated October 14, 2013. Section 8 of the FS is deficient. The Respondents' comparative evaluation is based on the evaluation of individual alternatives in Section 7. Unfortunately, because Section 7 is not consistent with the NCP and RI/FS guidance in the way in which many of the NCP 9 Criteria are meant to be applied, or the evaluation is incomplete, Section 8 does not contain justifiable results from the comparative analysis using the NCP's 9 Criteria.	As discussed in other comment responses, we disagree with the EPA's contention that Section 7 of the DFFS is inconsistent with the NCP and RI/FS guidance. We also disagree with the EPA's characterization of Section 8 of the DFFS as deficient. The primary substantive change in the EPA's rewrite of Section 8 is deletion of the comparative analysis for Alternatives 2 through 6 on the basis that these alternatives would not qualify for a TI Waiver (a premature consideration at the FS-stage of the remedy selection process).	As noted in PRP Response No. 1, EPA agrees that all alternatives will be included in the comparative analysis and that the TI waiver language may be removed.	Per August 27, 2015 meeting, EPA has revised this comment to be 'approved with comments'. The Final FS incorporates EPA's October 2014 version of Section 8 with revisions based on adding in Alternatives 2 through 6 to the comparative analysis and for consistency with revisions to Section 7.
5	General	**Renamed Alternatives.** EPA has renamed the Alternatives, except Alternative 2, because not all alternatives are containment alternatives. Generally, EPA just deleted the term "Containment" when used for Alternatives 3 through 10. EPA wants each alternative to reflect the difference between alternatives.			EPA's alternative names are adopted in the final FS.
6	General	**Addition of Alternative 4a.** EPA added the Respondents Preferred Alternative, 4a, into Section 6 and has carried it through the remaining sections of the FS. The text EPA used for Alternative 4a was developed by considering the text for Alternatives 3 and 4 and the Respondents' March 14, 2014 Technical Memorandum. Where information was lacking EPA considered information in Alternatives 3 and 5 as suggested by the Respondents. EPA stated several times that the Respondents should provide the same information for Alternative 4a as they provided to EPA for the other alternatives. EPA never received a complete set of information for Alternative 4a.	Relevant information for Alternative 4a was provided in Aspect's March 14, 2014 technical memorandum re: Proposed Preferred Remedy at the Site.	Comment noted.	Alternative 4a has been incorporated.

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7	General	**Habitat Area.** The Habitat Area shall not contain a PRB or collection trenches or other remedial technology without the permission of EPA, the Muckleshoot Tribes and Trustees. These technologies are incompatible with the purpose of the Habitat Area and cannot be maintained or replaced without significant damage to the Habitat Area. In addition, EPA does not want discussions about potential alternations of the shoreline in the FS —this is a remedial design issue. Additionally, so little information has been provided by the Respondents that EPA cannot comment on the concept of shoreline alternation. This is an issue for RD and would also be dependent on the alternative selected as the remedy for Quendall.	As previously directed by the EPA, the DFFS assumes that PRB/trenches are not located in habitat area. However, we disagree with the EPA's statement that all remedial technologies are incompatible with the habitat area. Compatibility should be evaluated on a case-by-case basis during remedial design. Categorically excluding remedial components in the habitat area without detailed evaluation of compatibility limits the effectiveness and potential benefits of certain remedial technologies.	Comment noted.	Based on discussions during 8/27/2015 meeting and email by Claire Hong dated 9/9/2015, Alternatives 2, 3, and 4A will show an amended sand cap with alteration of the shoreline consistent with Alternative 2 of the draft final FS.
8	General	**Renton SMP.** EPA has determined that the Renton SMP is not an ARAR.	We strongly disagree and have explained the basis of our objection to the EPA's ARAR determination in Respondent's letter to Lynda Priddy of the EPA regarding Dispute Resolution – Comment on Draft Final FS, dated November 6, 2014.	This issue has been addressed outside of the technical group.	Action-Specific ARAR table (Table 4-2) has been modified as determined in November 2014 dispute resolution, including adding Renton SMP as an ARAR.
9	General	**Risk-based PRGs at 10^{-6}.** EPA has identified risk-based PRGs at a risk level of 10^{-6} in the Draft Final FS. The exception is naphthalene in groundwater, where a RBC of 1.4 ug/L based on a risk level of 10^{-5} is used, for reasons provided in the text.	The EPA has not provided any basis for changing the risk level from 10^{-5} to 10^{-6} for identifying PRGs (for purposes of the DFFS)	EPA changed the risk level from 10^{-5} to 10^{-6} to be consistent with the NCP per 40 CFR 300.430(e)(2)(i), using 10^{-6} as a point of departure.	PRGs have been revised to reflect risk level of 10^{-6}. Note that per EPA comments, the table highlights the naphthalene PRG as 10^{-6}, but notes that the extent of naphthalene contamination from Quendall for the purposes of the FS is based on the 10^{-5} value. Note: the most recent RBCs, based on EPA's June 2015 RSLs, identify a naphthalene RBC of 1.7 ug/L rather than 1.4 ug/L.
10	General	**Impermeable Caps.** The Respondents cannot make claims that impermeable caps associated with future development can impact DNAPL mobility, etc., with the implication that it would aid remediation unless the	Evaluation of DFFS alternatives assume permeable caps. However, because impermeable caps	Respondents may include a discussion in the Final FS of how impermeable caps could affect the remedy.	A discussion of the effect of impermeable caps has been included.

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		Respondents want to install an impermeable cap during remedial action. Otherwise, the occurrence of an impermeable cap is speculation.	are a possible component of future development, it is important to state how such a cap would affect the remedy. Impermeable caps are expected to be compatible with the chosen remedy because, if anything, leaching would be reduced as stated in the DFFS. It is unclear why the EPA wants to remove this evaluation when it addresses a potential future change of Site conditions. Furthermore, EPA previously agreed to include impermeable caps in the groundwater model because of the likelihood that such a cap will be installed in the future.		
11	General	**Thermal Treatment.** The type of thermal treatment will be determined in RD. The term "thermal desorption" was often used and not well-defined. Thermal desorption can refer to a number of different thermal treatment systems, especially when the temperature range is not specified, or whether an afterburner is coupled with the treatment system. Therefore, the term "thermal desorption" is replaced by the term "thermal treatment".	Thermal desorption is well defined in Section 5.3.2.5. Thermal treatment is used in the DFFS as a more general term that includes vitrification and incineration. Replacing thermal desorption with thermal treatment adds confusion.	Respondents may add a footnote in the Final FS excluding vitrification from thermal treatment; otherwise the terminology change stands.	A footnote has been added to Section 6.1 where Alternatives 8, 9, and 10 are first described. The footnote is consistent with the revised text in EPA Comment Items 49 and 60.
12	General	**RCM Caps.** EPA has a number of concerns regarding the use of RCM caps. There is little, if any field data, on the service life of reactive materials as used in various technologies. Analytical calculations are used to "estimate" the service life or replacement rate of reactive materials. Additionally, the replacement process has not been described and the impacts associated with removing or adding additional material when needed. The obstacles to be encountered at Quendall when placing or removing RCM caps has not fully been addressed. The placement of a RCM could be compromised by the extensive amount of wood debris in or on the Quendall sediments. These issues have not been discussed sufficiently in the FS, especially in the evaluation of alternatives.	See PRP Response No. 7 to EPA Comment Item 3.a.iii. EPA Comment Item 121 indicates that EPA had no comments on Appendix C. The issues identified in this comment related to debris or replacement could be addressed in the FS and do not provide a basis for eliminating an organoclay RCM cap. A debris survey and removal of large debris would likely be part of the sediment remedy whether dredging or capping is selected. Typically, these caps are designed with a large factor of safety that	Respondents' comments are noted. Respondents may revise discussion of RCM caps in Section 7.3.3.2 in the context that RCM caps could still be used for alternatives that proposed them for T-Dock sediment. EPA will review revisions prior to finalizing the FS.	As discussed with EPA on 7/30/2015, RCM caps may also be proposed for nearshore areas. Alternatives 2, 3, and 4A include amended sand cap in QP-S DNAPL area (DA-6). All other caps above DNAPL sediments are RCMs.

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			minimizes the frequency and need for replacement. More Site-specific data could be collected to support a Site-specific application. The EPA-approved West Branch of the Grand Calumet River project includes a 6-inch organo-clay cap with an estimated design life of 420 years.		
13	General	**One Process Option.** EPA does not see a reason to include more than one process option in a given alternative (e.g., amended sand cap and RCM cap), as that decision can be considered during remedial design. EPA eliminated the amended sand cap and used the RCM cap as the representative process option.	In the EPA's rewrite, the EPA states that amended caps are more reliable and have fewer concerns for implementability, maintenance, and replacement than RCMs (Section 7.3.6.1). It is unclear why the EPA chose to retain the process option they perceive as less reliable. The EPA's comments and text rewrite expresses a bias against capping that is inappropriate for an FS, which is intended to objectively evaluate a range of remedial options.	As noted earlier, during the December 3, 2014 meeting, EPA agreed that in the Final FS, amended sand caps could be included for alternatives that proposed RCM caps in the nearshore area, and that RCM caps could still be used for alternatives that proposed them for T-Dock sediment. The Respondents may revise the text describing RCM caps, which EPA will review prior to finalizing the FS.	See Response to EPA Item #12.
14	General	**ENR Area**. EPA changed the ENR area to be determined as twice the BTV rather than 8 times the BTV.	What is the basis for 2X the BTV? No basis has been provided in the comments or in the revised text.	Respondents may use 8x the BTV in the Final FS and note that the actual criterion will be developed during RD. Respondents may add an appendix with the calculation supporting the 8x value.	Revision: Appendix B1b was added which consists of a calculation supporting the 8X value.
15	Executive Summary	1. Replace text with Attachment 4. 2. Delete Tables ES-2, ES-3, and ES-4. 3. Renumber remedy component figures to accommodate Alternative 4a. 4. Renumber original Figure ES-14 (projected groundwater restoration) to ES-16 and remove Note 1. 5. Original Figure ES-15 (DNAPL volumes removed or treated) remains Figure ES-15. 6. Delete original Figure ES-16 (reduction in mass flux).			The Final FS incorporates EPA's October 2014 version of the Executive Summary with revisions based on subsequent discussions with EPA and as noted in this table. Table and Figures have been revised as requested.
16	1.1, Modifying Criteria	Add "and Tribal" acceptance to Item 8.			Revised as requested.

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17	2.0, 1st paragraph, 4th sentence, and elsewhere in the document	Change "*Conner Homes*" to "Barbee Mill".			Revised as requested.
18	2.0, 4th paragraph; last sentence	Delete "*(catch and release)*".			Revised as requested.
19	3.1, last bullet	Delete sentence "*Tank bottoms from nearby storage tanks were also reportedly placed west of the North Sump, where Quendall Pond is now located.*"			Revised as requested.
20	3.1, new last bullet	Add an additional bullet (after the North and South Sump bullet): "Quendall Pond, located near the shoreline, was constructed in an area where tank bottoms from nearby storage tanks were placed. This area also received wastes from North Sump overflows. Waste from Quendall Pond has migrated into adjacent Lake Washington."	This text revision is misleading. We are not aware of any waste (e.g. DNAPL) from Quendall Pond migrating into Lake Washington. Suggested edit to last sentence: *DNAPL from Quendall Pond has migrated into* ***sediments beneath*** *Lake Washington.*	EPA disagrees with the suggested edit. There is insufficient data to support limiting the impact of Quendall Pond waste on the sediments in the lake versus the lake in general	Revised as requested.
21	3.2, last paragraph, 2nd sentence	Revise to: "Evidence from field observations suggest that interbedded, low-permeability layers in the Shallow Alluvium can stop, slow, or alter migration of DNAPL."			Revised as requested.
22	3.2, last paragraph, last sentence	After "*many remedial technologies*", add: "such as pump and treat and *in situ* thermal and chemical treatment".			Revised as requested.
23	3.3, 5th paragraph, 1st sentence	Revise to: "There is no continuous aquitard separating the Shallow and Deep Aquifers; however, the Deep Aquifer is considered to be a semi-confined aquifer, as the vertical hydraulic interaction between the Shallow and Deep Aquifers is limited by the horizontal stratification of the Shallow Alluvium, and varies depending on the location on the Site."			Revised as requested, with the following edits: 1) "*aquitard*" has been edited to "*aquitard layer*"; and 2) "*horizontal stratification of the Shallow Alluvium"* has been edited to "*horizontal stratification and low permeability layers within the Shallow Alluvium".*
24	3.5, 5th paragraph, 3rd sentence	Delete: "conservative drinking water-based" from this sentence.			Revised as requested.
25	3.5, 5th paragraph, last sentence	Add "at this location" after "low-permeability lacustrine silt/clay unit".			Revision added. Additional correction to this sentence made:

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					should be well BH-20C, screened from 113 to 120 feet bgs
26	3.5, 6th paragraph, last sentence	Replace last two sentences "*However, four samples…*" with: "There are a few instances of very low detections of benzo(a)pyrene above the MCL in areas outside of the DNAPL "footprint", but they are either bordering on the footprint (2 µg/L in BH-12 and 2.3 µg/L at BH-18A) or are at concentrations very close to the MCL (0.24 µg/L at BH-29A and 0.23 µg/L at WP-4)."	The new sentences should be added without the indicated deletion. Soil data are relevant to evaluating the distribution of cPAHs in groundwater in areas where the soil data provide better resolution than the available groundwater data. The soil data are important in the evaluation of the restoration time frame for benzo[a]pyrene.	EPA agrees that the new sentences can be added without the indicated deletion.	Revised as requested.
27	3.5, last paragraph, last two sentences	Change the last four sentences to: "The approximate extent of surface sediment contamination beyond the nearshore groundwater discharge area that is attributable to historical spills along the T-Dock is represented by the area exceeding the cPAH background threshold value (BTV) of 17.5 milligrams per kilogram normalized to organic carbon (mg/kg-OC).[11] The derivation of the BTV is described in Appendix B (B-1). It was used in this FS to approximate the extent of sediments that may require remediation. As depicted on Figure 3-11, approximately 29 acres of sediments at the Site exceed the BTV."			Revised as requested.
28	3.6.2.3, 1st paragraph, 2nd sentence	Change "*transition zone*" to "transition zone between groundwater and surface sediments/porewater".			Revised as requested.
29	3.6.2.3, 2nd paragraph, last sentence	Replace with: "The model was used to simulate downward flux of sulfate from overlying lake water, and the results are consistent with the reduction in BTEX and LPAH concentrations over the last several feet of transition zone between Site groundwater and the surface water of Lake Washington. Sulfate reduction processes may be occurring at the Site (even though there are no data to confirm sulfate reduction).			Revised as requested.
30	3.8, 3rd paragraph, 3rd and 4th sentences	Replace with: "The migration of dissolved indicator chemicals in groundwater is primarily controlled by the advective east-to-west groundwater flow and contaminant-specific mobility. Benzene and naphthalene are relatively mobile and, based on both empirical data and groundwater modeling, have likely migrated deeper primarily due to dispersion (to more than 110 feet bgs, impacting groundwater in the Deeper Alluvium), and further downgradient (i.e., toward Lake Washington) from DNAPL source areas compared to the less mobile cPAHs.			Revised as requested.
31	4.0	Replace with Attachment 2.			The Final FS incorporates EPA's October 2014 version of Section 4 with revisions based on subsequent discussions

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					with EPA and as noted in this table.
32	5.0, 2nd paragraph, last sentence	Replace "*It is expected…*" with: "Remedial technologies/ process options are defined in the Record of Decision; however, during remedial design minor changes in a particular process option, such as exchanging the type of reactive material to be used in a RCM, maybe considered if its implementation results in comparable or improved long-term effectiveness and reliability, lower cost, or a comparable or improved rating of any of the other CERCLA evaluation criteria. However, replacing one technology, such as an engineered sand cap for another technology, such as an RCM, could be viewed as a significant change and warrant an additional detailed technical evaluation and potential Explanation of Significant Differences.			Revised as requested.
33	5.1.1, 1st paragraph, 1st sentence	Replace "*engineering or institutional controls*" with "engineering controls or control of exposure to hazardous substances by use of institutional controls".			Revised as requested.
34	5.1.1, first bullet	Replace with: "**Institutional Controls.** Institutional controls are non-engineered measures that may be selected as remedial or response actions typically in combination with engineered remedies For example, institutional controls may include administrative and legal controls that minimize the potential for human exposure to contamination by limiting land or resource use (EPA 2000). The NCP sets forth environmentally beneficial preferences for permanent solutions, such as complete elimination risk or treatment of principal threats waste rather than control of risks using containment for example. Where permanent and/or complete elimination are not practicable, the NCP creates the expectation that EPA will use institutional controls to supplement engineering controls as appropriate for short- and long-term management to prevent or limit exposure to hazardous substances, pollutants, or contaminants. It states that institutional controls may not be used as a sole remedy unless active measures are determined not to be practicable, based on balancing trade-offs among alternatives (40 CFR 300.430 [a][1][iii])." Add (EPA 2000) to the references: EPA, 2000, Institutional Controls: A Site Manager's Guide to Identifying, Evaluating, and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups. OSWER 9355.0-74FS-P. EPA 540-F-00-005. September, 2000.			Revised as requested.
35	5.1.1, 5th bullet	Move "Removal" bullet to after "Ex Situ Treatment" and before "Disposal".			Revised as requested.
36	5.1.1, 6th bullet	Revise to: "*Ex situ* treatment technologies destroy or immobilize contaminants in media that have been removed from the media surface or subsurface."			Revised as requested.
37	5.2, 2nd bullet	Revise "*PAHs*" to "carcinogenic PAHs (cPAHs)".			Revised as requested.

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38	5.2, 3rd paragraph, 2nd sentence	Revise to: "Subsurface conditions, such as fine-grained soils, heterogeneous subsurface or lack of a continuous aquitard, can limit the effectiveness of many types of containment and groundwater collection technologies."			Revised as requested.
39	5.3.1.1	Fix typo: "optiozns"			Revised as requested.
40	5.3.1.1, 2nd paragraph, 1st sentence	Revise to: "These institutional controls can be effective when combined with active remediation such as capping sediments, are implementable under a wide range of conditions, and generally apply to the entire Site."			Revised as requested.
41	5.3.1.3, In Situ Thermal, 3rd paragraph, 1st sentence	Revise to: "*In situ* thermal treatment process options are expected to be more costly than other *in situ* treatment methods and more uncertain in effectiveness for treating creosote or coal tar DNAPL based on limited full-scale application."			Revised as requested.
42	5.3.1.3, In Situ Stabilization, 2nd paragraph, only sentence	Change "*potentially effective*" to "largely effective".			Revised as requested.
43	5.3.2.1, 2nd sentence	Revise to: "These institutional controls can be effective when coupled with active remediation and implementable under a wide range of conditions and generally apply to the entire Site."			Revised as requested.
44	5.3.2.2, 1st paragraph, 2nd sentence	Revise to: "The long-term cap integrity can be maintained through implementation of appropriate institutional controls and targeted long-term monitoring."			Revised as requested.
45	5.3.2.2, 2nd paragraph (after three bullets)	Delete: "Although implementation of low permeability and impervious caps are relatively more expensive then permeable caps, they may be appropriate in portions of the Site or for some future Site uses, and can be more effective than permeable caps by preventing infiltration and reducing leaching of contaminants. Permeable caps may be more cost-effective to protect against direct contact with contaminated soil in areas where leaching is not a concern."	We disagree with this deletion. See PRP Response No. 14 to EPA Comment Item 10.	Respondents may include a discussion of how impermeable caps could affect the remedy.	Original language discussing effect of impermeable caps has been retained.
46	5.3.2.3, In Situ Stabilization, 1st sentence	Revise to: *"In situ* solidification/stabilization described in Section 5.3.1.3 for DNAPL is applicable and effective for immobilizing Site COCs in soil as it is the most common remedial technology used at creosote/coal tar Superfund Sites."	What is the authority for the statement that *in situ* solidification/stabilization is the most common remedial technology used at creosote/coal tar Superfund Sites?	EPA will provide the Superfund annual report on remedy implementation.	Reference provided by EPA does not support that ISS is the most common remedial technology. Will revise text to state "…it is a remedial technology commonly used at…"
47	5.3.2.3, Bioremediation, last paragraph, 1st sentence	Delete "*Biodegradation is ongoing at the Site*".	We disagree with this deletion. In describing the potential effectiveness of bioremediation, it is important to note that biodegradation is an ongoing process at the	Respondents may keep this statement if supported, for example: "As evidenced by ____, biodegradation is ongoing at the Site."	Support for this statement has been added.

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			Site. Bioremediation is less effective at sites where natural biodegradation does not occur.		
48	5.3.2.5, Ex Situ Thermal Treatment, Thermal Desorption bullet, 2nd sentence	Revise to: "This technology is effective for VOCs and certain SVOCs, achieving 90 to 99.7 percent reductions…."			Revised as requested.
49	5.3.2.5, Ex Situ Thermal Treatment, last sentence	Revise to: "Therefore, thermal desorption has been retained as a representative *ex situ* thermal treatment process option for soil. However, for the purpose of the FS, it will be referred to as "thermal treatment", as the specifications for the treated material and emission standards will be determined during remedial design."			Revised as requested.
50	5.3.2.6, Onsite Beneficial Use, 1st paragraph	Fix typo: "use consist include".			Revised as requested.
51	5.3.3.4, PRB, 4th sentence	Revise to: "As groundwater flows through the barrier, permeable materials within the barrier sorb dissolved-phase constituents and can promote attenuation."			Revised as requested.
52	5.3.3.4, Bioremediation, paragraph after bullets, 1st sentence.	Change "*Biodegradation of Site COCs…*" to "Bioremediation of Site COCs…"			Revised as requested.
53	5.3.4.1, 2nd paragraph, 4th sentence	Delete: "In addition, for alternatives with a dredging component, short-term fish consumption advisories may be required due to the potential for short-term water quality and fish tissue impacts during dredging."			Revised as requested.
54	5.3.4.2, Sediment ENR, 2nd to last sentence	Delete: "Specifically, the thin-layer placement has remained stable during 10 years of monitoring".			Revised as requested.
55	5.3.4.5, Excavation, 1st sentence	Revise to: "Process options for nearshore excavation include:"			Revised as requested.
56	5.3.4.5, Excavation, 1st bullet	Revise to: "Use of long-reaching excavators positioned from upland staging areas to remove contaminated sediment combined with the use of sheet pile containment;"			Revised as requested.

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57	Section 5.3.4.5, Dredging, 2nd bullet, 2nd sentence	Revise to: "Environmental buckets vary in size and can be retrofitted to address different degrees of sediment hardness. For example, at the Todd Shipyard Sediment Operable Unit at Harbor Island (Todd), large steel plates were soldered to the sides of an environmental bucket to provide more weight for penetrating sediments. Appropriately large environmental buckets can be used to handle debris. For example, at Todd large and cumbersome shipyard debris was successfully removed (see Figure 5-1)." Create a new Figure 5-1 with the figure provided at the end of this comment chart. Caption the figure: "Environmental Dredge Bucket Used at Todd Shipyard, Harbor Island, Washington."	See PRP Response No. 5 to EPA Comment Item 3.a.i.	EPA stands by this revision.	Revised as requested.
58	Section 5.3.4.5, Dredging, 2nd paragraph, 2nd sentence	Revise to: "However, many of these effects are reduced due to recent innovations, increased operator expertise, use of containment (e.g., sheet piles, silt curtains, booms), best management practices (BMPs) (e.g., production rates, bucket control, etc.), and/or by equipment selection. Recent dredging events at the Boeing facility on the Duwamish River were accomplished without exceedances of sediment cleanup numbers."	We disagree with this revision because it fails to consider the presence of DNAPL. Recent innovations have reduced the 4R's (resuspension, release, residual, and risk) related to solid-phase contaminants, but do not completely address potential effects due to dredging sediments with DNAPL. The EPA's proposed revision is not adequately considering the complexity of the DNAPL source distribution and subsurface heterogeneity at the Site.	EPA is refining its comments to change "many of these effects are reduced" to "many of these effects may be reduced", and to delete the sentence referencing the dredging on the Duwamish.	Revised in accordance with refined comment.
59	Section 5.3.4.6, Ex Situ Treatment, 2nd paragraph, 1st sentence	Revised to: "Thermal desorption is equally effective as vitrification and incineration in treating VOCs and some SVOCs in excavated sediment but at a much lower relative cost; . . . "			Revised as requested.
60	Section 5.3.4.6, Ex Situ Treatment, 2nd paragraph, last sentence	Revise to: "Thermal desorption of sediments may be less effective than for soils due to the higher moisture content of sediment and typically requires dewatering of sediments prior to treatment. For the purpose of the FS, the term "thermal treatment" will be used, as the specifications for the treated material and emission standards will be determined during remedial design."	See PRP Response No. 15 to EPA Comment Item 11.	Respondents may add a footnote in the Final FS excluding vitrification from thermal treatment; otherwise the terminology change stands.	See response to EPA Comment Item 11 regarding added footnote.
61	6.0	Replace with Attachment 3.			Revisions to Attachment 3 have been made in accordance with subsequent discussions with EPA and documented resolutions.

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62	7.0	Replace with Attachment 5.			Revisions to Attachment 5 have been made in accordance with subsequent discussions with EPA and documented resolutions.
63	8.0	Replace with Attachment 6.			Revisions to Attachment 6 have been made in accordance with subsequent discussions with EPA and documented resolutions.
64	9.0	Add the following references: EPA, 2002, Estimated Per Capita Fish Consumption in the United States. U.S. Environmental Protection Agency, Office of Science and Technology. EPA 821-C-02-003. August 2002. King County, 1999, Lake Sammamish Baseline Sediment Study Sampling and Analysis Plan. Prepared by the King County Department of Natural Resources, Water and Land Resources Division, Modeling, Assessment, and Analysis Unit. August 1999. King County, 2000, Lake Washington Baseline Sediment Study. Prepared by the King County Department of Natural Resources, Water and Land Resources Division, Modeling, Assessment, and Analysis Unit. June 2000.			References have been added as requested.
65	Tables 4-1 through 4-3	Replace with tables provided in Attachment 2 (Revised Section 4).			Table 4-2 has been revised in accordance with November 2014 dispute resolution.
66	Table 4-4, Soil PRGs	1. Update the RSL reference to May 2014 and update values accordingly. 2. Update table to reflect that the PRG is based is on 10^{-6} rather than 10^{-5}. This includes changes to highlights and footnotes. 3. Change the lead background value from 16 to 17 (16.8 in Table 13 from Ecology, 1994). 4. Remove highlight from the 4.2 mg/kg ecological PRG for benzo(a)pyrene. 5. Provide reference for background concentrations. 6. Remove MCL in the notes. 7. Remove MTCA RBCs (MTCA calculated values are not ARARs; RSLs are more stringent).			Revisions made as indicated, except that the RSL values and reference have been revised to "June 2015", not "May 2014", to reflect the most recent RSL update.
67	Table 4-5, Groundwater PRGs	1. Update the RSL reference to May 2014 and update values accordingly. 2. Update table to reflect that the PRG is based on 10^{-6} rather than 10^{-5}. This includes changes to highlights and footnotes. 3. On the 0.14 RSL value for naphthalene (which will be highlighted as the PRG), add the following as a footnote: "For the purpose of estimating the			Revisions made as indicated, except that the RSL values and reference have been revised to "June 2015", not "May 2014", to reflect the most recent RSL update.

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		extent of the naphthalene plume resulting from contamination at Quendall, the RSL of 1.4 ug/L is used (see Section 4.3)." 4. Remove MTCA RBCs (MTCA calculated values are not ARARs; RSLs are more stringent).			Accordingly, based on the same June 2015 guidance, the 10^{-6} RSL value for naphthalene was changed to 0.17.
68	Table 4-6, Surface Water PRGs	1. The 22 ug/L PRG for benzene needs to be revised to 2.2 ug/L (reflecting risk of 10-6). 2. Even though benzene was the only COC identified in the Baseline Risk Assessment, National Water Quality Criteria for human health (water & organism) need to be added for the other COCs and treated as ARARs (supersede RBCs): http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm			Revisions made as indicated, except that based on the most current NWQC criteria, the PRG for benzene was revised to 2.1 ug/L.
69	Table 4-7, Sediment PRGs	1. Update table to reflect that the PRG is based on 10^{-6} rather than 10^{-5}. This includes changes to highlights and footnotes. 2. Remove the numbers from the notes that are not referenced with a number in the body of the table. 3. Remove fluorene. 4. Note #5 does not make sense. Update to: Fish/shellfish ingestion PRG back calculated from RI Report Table J-7-74, using sediment EPC of 602 mg/kg OC (RI Report Table 7.1-4). 5. Update Fish/Shellfish Ingestion – Site Sediment values as follows: Using a cancer risk of 3.1 x 10^{-3} for benzo(a)pyrene (RI Table J-7-74) associated with a fish EPC of 0.216 mg/kg (wet) derived from a sediment concentration 602 mg/kg OC (RI Table 7.1-4), the RBCs for fish consumption are 19, 1.9, and 0.19 mg/kg OC for 10^{-4}, 10^{-5}, and 10^{-6}. [(602 mg/kg/0.0031 risk)*0.0001 risk = 19 mg/kg OC at 10^{-4} risk] 6. Add a column for ARARs and include the new SMS values for the appropriate COCs. 7. In the "Notes" column on the right side, note that the background threshold value (BTV) of 17.5 mg/kg OC is a 95/95 UTL considered to be a "do not exceed" value for looking at individual concentrations and comparing them to site background. The BTV is an action level as opposed to a PRG. 8. The ecological PRGs are not OC-normalized and should be clearly noted as such.			Ok. Responding to comment *8" – For clarity, a note was added indicating that concentrations of all PRGs are not OC-normalized, unless indicated otherwise.
70	Table 4-8, PRG Summary	Update to reflect changes in previous tables.			Note the RSL reference was change to "June 2015", not "May 2014", to reflect the most recent update.
71	Table 4-9	Insert new Table 4-9 provided in Attachment 2 (Revised Section 4).			New table has been added.

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72	Table 5-8, Sediment Process Options Eval.	In situ treatment, bioremediation: Change first sentence to: "Technology widely demonstrated in upland applications, but not in sediment."			Revision made as requested.
73	Table 6-1, Alts to RAOs	Delete this table. It does not provide information on to what degree and RAO is addressed.			Table has been deleted.
74	Table 6-2, Assembly of Tech/Proc Options into Alts.	Renumber to Table 6-1 and include information for Alternative 4a. Remove "Containment with" from the names of Alternatives 3 through 10.			Revised as requested.
75	Table 6-3, Alternative Summary	Delete this table. It contains inconsistent information.			Table has been deleted.
76	Table 6-4, Construction Quantities	Renumber to Table 6-2 and include information for Alternative 4a. Remove "Containment with" from the names of Alternatives 3 through 10.			Revised as requested.
77	Table 7-1, NCP Criteria	Change "State (Support Agency) Acceptance" to State (Support Agency) and Tribal Acceptance".			Revised as requested.
78	Table 7-2, DNAPL Treated/Removed	Include information for Alternative 4a. Remove "Containment with" from the names of Alternatives 3 through 10.			Revised as requested.
79	Table 7-3, IC and LTM Summary	Delete this table.			Table has been deleted.
80	New Table 7-3, Summary Evaluation of Alternatives	Use Table 8-2 as a basis and update as follows: 1. Remove "Containment with" from the names of Alternatives 3 through 10. 2. Overall Protection of Human Health and the Environment: For Alternatives 1 through 6, "No". For Alternatives 7 through 10: "Yes". 3. Complies with ARARs: For Alternatives 1 through 6, "No" with a footnote stating "A TI Waiver would not be granted because PTW is readily accessible and removal or treatment is feasible with currently available engineering technology." For Alternatives 7 through 10, "Yes" with a footnote stating "It is assumed that a TI waiver would be granted if monitoring data indicate that MCLs may not be met, since all known PTWs would be addressed under this alternative." 4. For balancing criteria, update with ratings from the text of Section 7.	For 2&3 - See PRP Response No. 1 to EPA Comment Item 2.a above and PRP Response No. 34 to Page ES-12, *Overall Protection of Human Health and the Environment* Summary below. For 4 - There are inconsistencies in the text of Section 7 on ratings. Alternative 4 is rated low for long-term effectiveness in Section 7.5.3.3 and moderate in Section 7.5.1.3. Alternative 7 is rated low for short-term effectiveness in Section	For 2 & 3, see EPA's response to PRP Response No. 1. For 4, the Respondents should correct ratings to reflect what they are in specific criteria sections, not where they are referenced (in error) in other sections. Ratings modifications are addressed in PRP Response No. 48.	Revised as requested. Also included information for Alternative 4a.

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			7.5.1.3 and moderate in Section 7.5.5.5.		
81	Table 8-1, Comparative Rating of Alternatives	Delete this table.			Table has been deleted.
82	New Table 8-1	Duplicate new Table 7-3 and revise as follows: 1. For Alternatives 1 through 6, replace symbols for the balancing criteria with dashes. 2. Add footnote to the Overall Protectiveness of Human Health and the Environment criterion for Alternatives 1 through 6 stating "Because this alternative does not satisfy the Threshold Criteria, it is not carried forward in the Balancing Criteria comparison."	See PRP Response No. 34 to reference *Page ES-12, Overall Protection of Human Health and the Environment Summary* below.	EPA agrees to strike this comment.	Table 8-1 has been revised to note that Alternative 1 has not been carried forward in the balancing criteria comparison.
83	Figure 3-2	Add Quendall Pond to this figure. Even though officially constructed in 1972, it is the location where tank bottoms were reportedly placed and where contaminated fluids discharged to the North Sump may have migrated via surface or subsurface flow.			Revised as requested.
84	Figure 3-12	Add Quendall Pond to the graphic.			Revised as requested.
85	New Figure 5-1	Create a new Figure 5-1 with the figure provided at the end of this comment chart. Caption the figure: "Environmental Dredge Bucket Used at Todd Shipyard, Harbor Island, Washington."			New figure has been added.
86	Figure 6-1	Remove altered shoreline depiction.			Altered shoreline retained per discussions with EPA (see response to comment #13)
87	Section 6 figures, general	Add figures for Alternative 4a and renumber figures accordingly.			Revised as requested.
88	Section 7 figures, general	Include information for Alternative 4a.			Revised as requested.
89	Appendix A, Section A3, Item 2	Typo: Superscript 2 at the end of the last sentence.			Revised as requested.
90	A3.1.2.1, 1st bullet	Provide a range, median, and standard deviation to put the 0.77 mg/L in perspective.			Revised as requested.
91	A3.1.3, 1st paragraph	Clarify that heterogeneity in the Deep Aquifer is limited to the relatively thin upper transition zone.			Per 8/27/2015 meeting, transition zone reference removed but description of Deep Aquifer heterogeneity has been added to A3.1.3 as well as a reference to A5.1.1

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					for more detailed discussion of heterogeneity.
92	A3.4, 4th paragraph	Provide a brief basis for the statement of no hotspot pumping benefit. The concept of "printing resolution" needs to be explained.			Revised as requested.
93	A5.3.4, 4th paragraph	2,500 gpm is acknowledged to be a significant overestimation in the text, but is used to make this option unfavorable – a common theme with the dewatering calculations. This discussion must be augmented to increase facts and minimize broad brush assumptions and conclusions. Without more foundational basis it is hard to evaluate the potential benefits.			Additional information added to the text. Estimated 1,300 gpm capture from offshore provides conservative lower bound.
94	Table A-1	Footnote 2. Provide additional detail on how f_{oc} values from the references were selected for the model. For example, the use of minimum values allows the COC to be more mobile and thus the size of the baseline plume may be larger than reality.			Footnote has been added.
95	Table A-2	In addition to average, add minimum, maximum, median, and standard deviation.			Table has been updated accordingly
96	Table A-3	Provide rationale for using an arithmetic average over some other statistic to represent these concentrations over an area.			A note has been added to table A-3.
97	Table A-7	1. Include a note about why the volume of the arsenic plume increases as opposed to no action. 2. Include a note about why the volumes of benzene and naphthalene are higher for Alternative 9 than for Alternative 7. 3. For Alternative 8, benzo(a)pyrene plume volume percent of 67% seems incorrect. Please confirm.			1. A note has been added. Clarification: assumed comment meant to say why volume of the arsenic plume increases as opposed to pre-remediation. _2 Volumes are higher due to recontamination of clean backfill. A note has been added. _3__Results have been confirmed using direct model output. The result is due to recontamination of excavation backfill.
98	Table A-8	Darcy Flux is confusing – instead of cm/s, show cubic cm/s per square centimeter. Check text for consistency, to be clear that it is not a velocity calculation (DF/porosity).			Revised as requested.
99	Figures A-13 through A-21	Add a large note that all applicable contours (for plan view Figures A-13 through A-17 and cross-sections for Figures A-18 through A-21) contain large solidified areas that do NOT contribute to the final plume volumes. Reference Tables A-6 and A-7, where remediated plume volumes are presented, excluding the volume of solidified materials.			A note has been added.

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100	Appendix B-1, cPAH BTV Derivation	Replace this appendix with the material provided at the end of the comment chart regarding derivation of the cPAH BTV value.			The material provided at the end of the comment table was used as a replacement for the previous Appendix B-1
101	Appendix B-2, Sand Cap Modeling, Section B2-1, 2nd & 3rd paragraphs	The RI versus current FS evaluations are unclear. Using discrete depth porewater concentrations of selected cations and naphthalene and benzene in native sediment, the RI evaluation demonstrated that the significant concentration reductions of naphthalene and benzene in groundwater/porewater entering the lake were not strongly influenced by surface water dilution, but likely other processes such as biotic and abiotic degradation. NO chemical isolation modeling results were reported in the RI. The current effort uses modeling to determine the concentration/mass loading from the natural groundwater/porewater system to the bottom of a cap. (i.e., taking the RI work to the next step). Then the performance of a cap (i.e., what steady state concentrations at the surface water cap interface) is evaluated. The use of the term "current conditions model" is unclear unless the overall modeling process framework is properly given a foundation.			Text has been added to the introduction section to clarify the step-wise approach to the modeling presented in Appendix B. Specifically that site-specific physical, chemical, and biological parameters for existing conditions were calibrated using site data. Then these parameters were used as model inputs to simulate the effect of a chemical isolation cap.
102	Appendix B-2, B2-1, 3rd paragraph	End of second sentence. Add that the meaning of the constant dissolved source contaminant concentrations is that the input from the natural system to the bottom of the engineered cap is assumed constant. Because the likely process that is reducing naphthalene and benzene concentrations is biologic, then what evidence is there that if the native sediment biota is covered by an engineered cap that the same degradation and thus source term to the bottom of the cap will take place?			Text was added to the last paragraph stating current COC loading to sediment is representative of loading to the bottom of the isolation cap layer. No site specific evidence exists that the extent of degradation of benzene and naphthalene within capped sediments will be identical to current uncapped degradation, however both benzene and naphthalene are relatively biodegradable, including under the future capped physical chemical conditions and so the extent of degradation will be comparable.
103	Appendix B-2, B2-2.1, 2nd paragraph, 2nd sentence	The constant source includes through the sediments to the bottom of the cap. Again there is confusion of the two uses of the UT model in the FS. The statement that detailed simulation of transport within the underlying soils and groundwater is not necessary is not clear unless you mean that the source term entering the natural porewater/sediment zone is constant for the use of the model to predict natural loading to the bottom of the cap (using cation and			Text was added to the introduction section of the appendix to clarify the two uses of the model. Text has also been revised within the first sentences of Section B2-

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		actual contaminant concentrations) and that after establishing natural concentration/flux that those concentrations/flux will be constant and will be used as input to the engineered cap and that the cap performance will then be evaluated with the UT model. Need to make clear the descriptions of the two uses of the UT model in this FS. Discuss at a high level then point to Section B2-2.2 (Approach) for more details.			2.2 to clarify the two uses of the model. The purpose of Section B2-2 is to describe the model and how the model works
104	Appendix B-2, B2-2.2	Add a summary statement to this section noting that the initial model helps establish the long-term contaminant concentrations/fluxes to the bottom of the cap based on Site data and the second model evaluates the engineered cap performance.			The text has been updated as requested.
105	Appendix B-2, B2-3.1 2nd paragraph 2nd sentence	Change "*Since many of the parameters…*" to "Since many of the model input parameters…"			The text has been updated as requested.
106	Appendix B-2, B2-3.1 3rd paragraph 1st sentence	Change "*Once the model input parameters…*" to "Once the model input parameters…"			The text has been updated as requested.
107	Appendix B-2, B2-3.1 3rd and 4th paragraphs	First uses of the term "cation model". Use consistent terminology throughout this appendix. Suggest using "Cation Model" instead of Initial Model as it is more descriptive; suggest using "Cap Model" or "Cap Evaluation Model" for the modeling used to evaluate the cap performance.			The text was revised to be consistent in reference to the initial model.
108	Appendix B-2, B2-3.1 4th paragraph, last sentence	Change "*by increasing degradation rates for these COCs*" to "by increasing biotic and abiotic degradation rates for these COCs".			The text was revised to "by increasing chemical and biological degradation rates" to be consistent with other sections of the text.
109	Appendix B-2, B2-3.2.1.1	Usable data are available from greater than 40 cm. The choice of 40 cm needs additional discussion and foundation.			As stated in Section B2-3.2.1.1, 40 centimeters represents the average depth of the greatest COC concentrations observed in samples collected during the RI.
110	Appendix B-2, B2-3.2.1.3	Groundwater seepage velocities – clarify real average linear groundwater velocity or Darcy flux?			Darcy flux is the average linear groundwater velocity. The text has been revised to Darcy velocity for consistency.

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111	Appendix B-2, B2-3.3	The statements in the text do not coordinate well with the referenced figures. There is no real comparison of modeled versus actual data to evaluate the statement that the figures show good agreement.			The figure was revised to clarify how the actual data is illustrated. Text was added providing additional support of the agreement between modeled results and actual results.
112	Appendix B-2, B2-4.3	The question of what will be the input to the bottom of the cap after the cap is installed must be addressed. What effect does adding the cap have on the biotic and abiotic degradation processes?			No edit was made to the text. The cap modeling approach described in Section B2-4.2 states that concentrations of benzene and naphthalene loading to the bottom of the conceptual cap equaled average concentrations of these COCs measured in the top 10 centimeters of the existing sediment. The presence of a sand cap is not expected to have a significant long term impact on chemical or biological degradation rates for benzene and naphthalene below the cap.
113	Appendix B-2, Table B2-1	Add full rationale and discussion for lumping all cations into average cation concentrations.			A note has been added to the table stating the cations have been averaged to provide a more representative concentrations of the cations for a mixed model.
114	Appendix B-2, Table B2-2	Add a discussion of why the 40 cm benzene and naphthalene porewater concentrations are higher at 40 cm than at deeper.			The concentrations of COCs were obtained from the RI data. No evaluation was performed related to the reason this depth has the highest concentrations.
115	Appendix B-2, Figure B2-1	Change "Biodegradation" to "Biodegradation + Abiotic degradation".			The figure has been revised as requested.

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116	Appendix B-2, Figures B2-2 and B2-3	Several comments: 1. Cap-water interface is really the natural sediment water interface, correct? 2. To what does the label "Underlying Sediment" refer? 3. What is the red bar? 4. What is below 40 cm? These are important figures and need to be complete and standalone. Notes on figures can help add clarity and coordinate better with text.			1. Yes it is the existing sediment-water interface. 2. Underlying Sediment refers to the existing sediment. Label revised. 3. The red bar represents the average normalized cation concentration and naphthalene concentration for the top 10 cm in Figures B2-2 and B2-3, respectively. 4. As stated in the text, the model was applied to the top 40 centimeters of the existing sediment. This is reflected in the figure. Concentrations below 40 cm are assumed to be equal to the initial concentration.
117	Appendix B-2, Figure B2-5	Draw the sediment/cap interface boundary on the figure. Is the cap 0-45 cm?			The figure has been revised as requested.
118	Appendix B-3, General	The analysis is Appendix B-3 is at most a screening-level analysis conducted for the purpose of estimating cost in the FS and a much more robust analysis will be required in remedial design before the need for armoring is accepted by EPA.			Comment Noted.
119	Appendix B-4, General	Not reviewed.			Comment noted.
120	Appendix B-5, General	New appendix from Draft FS; not reviewed.			Comment noted.
121	Appendix C, Technologies and Process Options	No comments.			
122	Appendix D, Ex Situ Thermal	Additional cost elements for ex-situ thermal technology could include treatment pad installation, sampling and analysis for process control, mobile equipment rental/leasing, utilities, as well as off-gas treatment. Additional details should be provided to support unit costs related to ex-situ thermal, including any potential materials credits following construction completion. (Comment from Draft FS, not addressed.)			Per 8/27/2015 meeting, clarification added that unit costs are all-inclusive, including installation, sampling, utilities, and off-gas treatment; breakout of cost elements not required.

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123	Appendix D, Dredging BMPs	Costs for dredging BMPs could lead to a significant increase in per-cubic-yard cost for dredging. Respondents should describe how these are represented in the 25% contingency. (Comment from Draft FS, not addressed.)	Need to clarify to which BMPs the EPA is referring. The sediment environmental controls and sheet pile enclosure costs are explicitly included in the cost estimate and are not built into the dredging unit cost or covered entirely in the contingency.	EPA agrees to strike this comment.	No revisions necessary.
124	Appendix D, In situ Stabilization, Treatability Studies	The Draft FS does not provide specific cost assumptions for required treatability studies, nor information on what was included in contingency costs, and should specify such detail. (Comment from Draft FS, not addressed.)			This information is included in footnotes to the cost tables in Appendix D. Per 8/27/2015 meeting, no further detail required.
125	Appendix D, General Mob/Demob	Please note if the Mob/Demob also includes bonds and insurance? Note indicates mobilization, demob, & temp facilities. (Comment from Draft FS, not addressed.)			This information is included in footnotes to the cost tables in Appendix D. Per 8/27/2015 meeting, no further detail required.
126	Appendix E, Eng. Calculation Sheets	Not reviewed critically for Draft FS (only for reference); also not reviewed critically for Draft Final FS.			
127	Appendix F, Shoring Design Considerations	New, not reviewed.			
128	New Appendix G	EPA requires the "Baseline Wetland and Habitat Report" to be included in an appendix to the Final FS.			The Baseline Wetland and Habitat Report has been added as Appendix G.

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30	Page ES-2, *Site Description and Source Area*	*Waste from Quendall Pond has migrated into adjacent Lake Washington.*	See PRP Response No. 19 to EPA Comment Item 20.	EPA disagrees with the suggested edit (same as Comment 19).	EPA text has been retained.
31	Page ES-7, *Site Areas and Media Targeted for Remedial Action* Also Section 4.4.1.8	*DNAPL at the Site cannot be reliably contained because any vertical barrier/treatment wall that would be installed at the Site could only be a "hanging" wall. There is no aquitard in which to anchor a barrier/treatment wall.*	The EPA's characterization that there is "no aquitard" is misleading when used in this context. The shallow alluvium contains laterally extensive low permeability peat deposits that in the aggregate limit the downward migration of DNAPL at the Site. A complete physical barrier (sides and bottom) is not needed to reliably contain all Site DNAPL. DNAPL present as oil-coated soil is not mobile. There is a finite source, and even if DNAPL present as oil-wetted soil were disturbed by future earthquakes, etc., most could not move beyond the Site boundaries. DNAPL containment strategies implemented at other CERCLA sites include hanging walls (e.g., McCormick and Baxter, PSR).	In the December 3, 2014 meeting, EPA agreed to provide an additional response regarding this issue. EPA is refining its comment to include the constituents leached from DNAPL. Revised wording: *"DNAPL and groundwater-leachable constituents cannot be reliably contained because . . . "* The stratigraphy/geology of the shallow alluvium, in aggregate, limits downward and lateral migration of mobile DNAPL. However, leached constituents such as benzene and naphthalene from the DNAPL source have been observed at great depths in the coarse alluvium. Therefore, the lack of a substantial, continuous, horizontal aquitard separating the shallow alluvium from the coarse alluvium renders a downgradient hanging barrier/treatment wall less effective. In addition, McCormick & Baxter is not a relevant reference because it is mostly a fully-encapsulating wall keyed to a relatively thick silt formation, except for an area near one corner. It also includes a RCRA cap that prevents infiltration.	Per 8/27/2015 meeting, to be modified to state 'EPA believes that DNAPL at the Site cannot be addressed through containment alone…'

[1] PRP Response numbers reference the response table and letter dated and submitted to EPA on November 14, 2014.

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32	Page ES-12, *RAOs for Protection of Human Health*	*Alternatives 7 through 10 treat or remove all known PTWs and, therefore, may restore groundwater to meet drinking water standards for one or more COCs throughout most of the plume, if not all of the plume. For these alternatives, institutional controls that specifically address use of drinking water would not be fully required in perpetuity.*	We disagree with this point and the EPA does not provide a technical basis for these statements. Leaching from the solidified mass would likely require ICs for drinking water in perpetuity.	See EPA's response to PRP Response No. 1. Cited language can be changed to indicate that alternatives that treat or remove all known PTWs have significantly greater effect on plume reduction than those that leave known quantities of PTW behind. For these alternatives, institutional controls that specifically address use of drinking water may not be required across the entire site in perpetuity.	Per 8/27/2015 meeting, revised language provided in July 2015 has been added but with 'significantly' deleted.
33	Page ES-12, *RAOs for Protection of Human Health*	*…whereas a soil cap may not be needed for Alternatives 7 through 10, where all PTWs are removed or treated.*	Alternatives 7 through 10 leave contaminated soil (not DNAPL) in place that exceeds PRGs, and a soil cap would still be needed.	Respondents may qualify that less soil cover may be required for these alternatives.	Potential for thinner upland caps under Alternatives 7 through 10 is discussed.
34	Page ES-12, *Overall Protection of Human Health and the Environment Summary* Also Sections 7.3.1.3, 7.4.1.3, 7.5.1.3, 7.6.1.3, 7.7.1.3, and 7.8.1.3.	*Alternatives 2 through 6 would not meet [the threshold criterion Overall Protection of Human Health and the Environment.]*	It is unclear whether the EPA is claiming that Alternatives 2 through 6 would not meet this criterion due solely to the ARAR compliance issue, or whether the long-term effectiveness and permanence of these alternatives is also judged to be inadequate. The NCP states (*40CFR 300.430(e)(9)(iii)(A)*): *Overall protection of human health and the environment. Alternatives shall be assessed to determine whether they can adequately protect human health and the environment, in both the short- and long-term, from unacceptable risks posed by hazardous*	See EPA's response to PRP Response No. 1.	See Response to EPA Comment #2.

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			substances, pollutants, or contaminants present at the site by eliminating, reducing, or controlling exposures to levels established during development of remediation goals consistent with § 300.430(e)(2)(I). Overall protection of human health and the environment draws on the assessments of other evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs. The analysis must <u>draw on</u> the assessment of other criteria. The fundamental question is whether exposures are controlled in the short-and long-term. Since ICs can be used to control exposure to groundwater exceeding MCLs, protection is achieved. In addition, the EPA determines that leaving untreated DNAPL on site results in an unacceptable risk, but does not provide its rationale. Region 10's interpretation essentially precludes consideration of containment of DNAPL as a component of any remedial action at the Site. This is inconsistent with the EPA's policy on PTW and how it has been applied at other Superfund sites involving DNAPL.		

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35	Page ES-13, *Overall Protection of Human Health and the Environment Summary*	*Alternatives 7 through 10 would meet [the threshold criterion Overall Protection of Human Health and the Environment] because all known PTWs are removed or treated. They would also likely comply with the MCL ARAR…*	The linkage between PTW removal/treatment and meeting overall protectiveness is not clear. The statement that Alternatives 7 through 10 would likely comply with the MCL ARAR is not supported. Also, in a footnote the EPA states that some DNAPL *could be inadvertently missed during remedial implementation.* Is the EPA confident that this residual DNAPL is unlikely to significantly impact groundwater quality?	See EPA's response to PRP Response No. 1. Language such as "would likely comply with the MCL ARAR" can be changed to indicate that alternatives that treat or remove all known PTWs are presumed to have significantly greater effect on plume reduction than those that leave known quantities of PTW behind (e.g., Alternative 6 leaves 40,000 gallons). Regarding "Is EPA confident that this residual DNAPL (inadvertently missed) is unlikely to significantly impact groundwater quality?" – EPA's focus is on doing as much work as is practicable to address known PTW and reduce the source of groundwater contamination, expecting not all the PTW may be found (common in any cleanup scenario). Groundwater impacts from residual DNAPL are expected to be significantly less than those leaving 40,000 gallons or more of known PTW behind (Alternatives 1 through 6).	See Response to EPA Comment #2.
36	Page ES-13, *Compliance with the MCL ARAR*	*Benzene was predicted to exceed its MCL after 100 years for Alternatives 1 through 7 and 9. It was predicted to achieve its MCL after 28 years for Alternative 8, and after 14 years for Alternative 10. EPA believes that the timeframes for Alternatives 8 and 10 may also be relevant for Alternatives 7 and 9, given that the extent of benzene MCL exceedances based on empirical data are smaller than the model predicts, in situ solidification is likely to oxygenate the subsurface and aid in volatile attenuation, and the resulting solidified materials are not considered to be aquifer materials.*	The third point (solidified materials are not aquifer materials) is already accounted for in the groundwater model. The assumption that oxygen added during solidification will greatly reduce restoration time frame is not supported by any data; rather, similar remediation techniques (oxygen-release compounds) are not effective given the mass of	In the December 3, 2014 meeting, EPA noted that the Respondents may remove sentences saying that restoration timeframes for Alternatives 8 and 10 may be relevant for Alternatives 7 and 9. The Respondents may also remove the statement inferring that ISS may oxygenate and aid in volatile attenuation.	Indicated statements have been removed.

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			contaminants found in DNAPL. Finally, the groundwater model over-prediction of the benzene plume extent has nothing to do with estimated restoration time frame under solidification scenarios. The solidified mass acts as an on-going source in perpetuity. It is unclear how the EPA can, on this basis, conclude that these very different alternatives may have similar restoration time frames.		
37	Page ES-13, *Compliance with the MCL ARAR*	*The reason the groundwater model predicts MCL exceedances after 100 years for Alternatives 7, 8, and 9 is that it assumes a baseline condition in where benzo(a)pyrene exceeds the MCL outside of the DNAPL areas; therefore, even when the DNAPL source is removed, the model assumes that the MCL exceedances remain and do not degrade over time.*	This is incorrect – the groundwater model <u>does</u> assume that residual BaP degrades over time; it just takes >100 years to achieve the MCL.	In the December 3, 2014 meeting, EPA noted that the Respondents may change "do not degrade over time" to "do not significantly degrade over time".	This statement has been removed to be consistent with revisions to the parallel discussion in Section 7.1.1.2 (see PRP Response No. 44a)
38	Page ES-14, *Compliance with the MCL ARAR*	*For Alternatives 7 through 10, EPA believes that if the known DNAPL source is removed or treated, arsenic will also be more significantly reduced than the modeling predicts.*	We disagree with this point and the EPA does not provide any authority for this statement.	Respondents may change "arsenic will also be more significantly reduced" to "arsenic may also be more significantly reduced".	This statement has been removed to be consistent with revisions to the parallel discussion in Section 7.1.1.2 (see PRP Response No. 44a)
39	*Section 4.4* • *DNAPL Cumulative Thickness.*	*Greater cumulative thicknesses of DNAPL (either oil-coated or oil-wetted) can contribute more significantly to groundwater contamination. Further, DNAPL residuals present as thin stringers have more surface area per volume of DNAPL; therefore, cumulative thicknesses that comprise multiple layers may impact groundwater as much or more significantly than contiguous DNAPL occurrences.*	We disagree with this point and the EPA does not provide any authority for this statement. Contribution to groundwater depends also on geology, groundwater occurrence, and DNAPL leaching characteristics/weathering. The Site area with the greatest cumulative thicknesses (North Sump) has relatively modest contaminant concentrations in groundwater.	EPA agrees that multiple factors affect contribution to groundwater, but this section is focused on DNAPL cumulative thickness and the text is intended to provide support for why it is used as differentiator for the array of alternatives. Regardless of the effect on groundwater, PTW is defined as visibly oil-coated or oil-wetted soil or sediment, Cohen and Mercer (1993, cited in the RI Report) provides support for the concept of NAPL fingers and ganglia having more contact area with groundwater than an	Revision made in accordance with July 2015 response.

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				equivalent pool of NAPL. They note that these ganglia may produce higher chemical concentrations in groundwater, while depleting the NAPL source more quickly than a NAPL pool of equivalent mass. Conversely, DNAPL pools (greater thicknesses of oil-wetted materials) may provide a source of groundwater contamination long after residual fingers and ganglia have been depleted. The Respondents may revise the first sentence to: "may contribute". The second sentence may be revised to reflect the discussion above. The Respondents may also add a sentence noting that contribution to groundwater also depends on geology, groundwater occurrence, and DNAPL leaching characteristics/weathering.	
40	*Section 4.4.1.1 Railroad DNAPL Area (RR DNAPL Area)*	*Boring BH-30C is also the only location at the Site where DNAPL has been observed in the transition zone between the Shallow Alluvium and Deep Alluvium.*	What is the "transition zone"? The RI does not refer to a transition zone and there does not appear to be any basis for labeling the area between the Shallow and Deep Alluvium as a transition zone.	EPA agrees to strike this revision.	Text has been restored to match DFFS.
41	*Section 4.4.1.8 Key Factors Influencing DNAPL Remediation*	*EPA has determined that DNAPL at the Quendall Site, whether in soils or sediments, is to be considered as PTW because of the high level of toxicity inherent in the creosote/coal tar DNAPL. Creosote/coal tar contaminants present in DNAPL (benzene and naphthalene) are also highly leachable and mobile via groundwater, and DNAPL classified as oil-wetted may also be mobile.* *DNAPL at the Site cannot be reliably contained because any vertical barrier/treatment wall that would be installed at the Site could only be a 'hanging" wall. There is no aquitard in which to anchor a barrier/treatment wall.*	Some Site DNAPL has lower mobility, lower leachability, and/or lower toxicity and should not be classified as principal threat waste. Lower mobility DNAPL at other CERCLA sites (e.g., Utah Power and Light) has been characterized as low-level threat waste. We believe this same designation is appropriate for portions of the	EPA stands on its definition of visibly oil-wetted or oil-coated soil or sediment as PTW, which is to be addressed consistently. Differing locations (e.g., depth) and mobility may influence prioritizing interim actions but a final remedy must address all PTW unless technically impracticable.	Per 8/27/2015 meeting, this sentence has been modified to state 'DNAPL at the Site cannot be addressed through containment alone…'

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		DNAPL is accessible. The majority of DNAPL in the uplands is found within the top 20 feet of the Shallow Aquifer with two exceptions (RR Area and Former May Creek Channel).	DNAPL source at the Site. The EPA has provided no basis for designating all of the DNAPL as PTW. See PRP Response No. 31 to Page ES-7, Site Areas and Media Targeted for Remedial Action above. Sediment DNAPL is located in layers as deep as 16 feet below mudline, which provides severe technical challenges for removal.	As noted earlier, EPA is refining its comment to include the constituents leached from DNAPL. Suggested wording: "DNAPL and groundwater-leachable constituents cannot be reliably contained because . . . " Regarding accessibility, the text may be revised to indicate that the majority of site DNAPL is accessible, with exceptions being in the RR Area and Former May Creek Channel in the uplands and in some nearshore areas.	
42	*Section 6.3.4.5 (for example)*	*An engineered sand cap would be placed over sediments where porewater data exceeds cleanup numbers…*	What are 'cleanup numbers'?	Cleanup numbers are equivalent to PRGs. The Respondents may revise this text accordingly. In the December 3, 2014 meeting, EPA and Respondents also agreed to confirm understanding of the purpose of the sand cap. In a December 5, 2014 email from Respondents' Consultant to EPA, the following was provided: "To clarify, the proposed Engineered Sand Cap composed of 1.5 feet of sand in the nearshore Non-DNAPL areas would sufficiently reduce contaminant flux such that surface sediment porewater/surface water PRGs would be attained." Please ensure that this is clear in the final FS.	References to cleanup numbers have been replaced with PRGs.
43	*Section 7.1.1.1 Overall Protection of Human Health*	*In the detailed evaluation of each alternative, the Overall Protectiveness criterion will be rated as "No", or "Yes", based on consideration of whether: 1) all exposure pathways are mitigated; 2) the alternative has long-term effectiveness and permanence; 3) does not pose a high short-term risk; and*	See PR Response No .34, to Page ES-12, *Overall Protection of Human Health*	See EPA's response to PRP Response No. 1.	See Response to EPA Comment #2.

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	and the Environment	*4) meets ARARs or is waived from the requirement for compliance with an ARAR.*	*and the Environment* Summary above.		
44a	*Section 7.1.1.2 Compliance with ARARs*	• *Because the baseline-generated plumes are larger than empirically determined plumes, the predicted model outcomes (restoration time frames and resultant plume sizes) are also likely to be "larger" than actual outcomes. This infers the following:* • *Model-estimated restoration time frames are longer than the actual time frames would be.* • *Model-estimated plume volumes (based on incremental removal of source) are larger than the actual plume volumes would be.* • *This is especially important for Alternatives where all source materials are treated or removed (Alternatives 7 through 10).* ◆ *For benzene and naphthalene, the remaining contaminant mass will flushed and the mass and thus groundwater concentrations of these COCs would decay over time based on their half-lives.* ◆ *For benzo(a)pyrene, empirical data indicate a close association of MCL exceedances with the occurrence of DNAPL. The model baseline condition plume for benzo(a)pyrene includes areas outside of the DNAPL footprint with MCL exceedances, while empirical data show no exceedances.[2] Therefore, the model results show that, if the DNAPL source is removed, then there are still areas of the Site with MCL exceedances that would not significantly degrade overtime. Based on empirical data, if the DNAPL source is removed, then the benzo(a)pyrene plume should also be fully addressed.* ◆ *For arsenic, treatment or removal of the DNAPL source is anticipated to affect a change in the subsurface reducing conditions that have enhanced arsenic mobility.* *[1] Note that there are a few instances of very low detections of benzo[a]pyrene above the MCL in areas outside the current DNAPL "footprint." In most cases, they are immediately outside the footprint or only marginally above the MCL (0.24 micrograms per liter in BH-29A, compared with the MCL of 0.2 micrograms per liter).*	The EPA's inference is flawed. The groundwater model assumptions that lead to over-predictions of plume size do not necessarily over-predict restoration time frame. Leaching from the solidified block would create a 'halo' (acknowledged by the EPA in the subsequent paragraph) that would remain in perpetuity and not be 'flushed out' as indicated by the EPA. Also, as the EPA acknowledges, benzo[a]pyrene is present in groundwater above MCLs outside the area of DNAPL. Benzo[a]pyrene is also present in soil outside the area of DNAPL at concentrations that leach to groundwater resulting in concentrations above MCLs. Because of the recalcitrant nature of benzo[a]pyrene, concentrations above MCLs would persist very long after source treatment. See also PRP Response No. 37 to Page ES-13, *Compliance with the MCL ARAR* above.	In the December 3, 2014 meeting, EPA committed to review this comment again. Upon further review, the Respondents may delete the cited text.	Text has been deleted.

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44b	*Section 7.1.1.2* *Residuals from in situ solidification.*	*It is expected that there will be a "halo" around the solidified area(s). The mobile benzene and naphthalene that leaches from the block(s) will be undergo degradation and will be dispersed and diluted in the groundwater. Because benzo(a)pyrene is essentially immobile, it will not likely leach from the block(s) or leach only a de minimis amount. EPA does not considered the solidified block as aquifer material; however the model assumes no change in groundwater concentrations in the block as a result of the solidification. This assumption most likely yields greatly over-stated initial post-remediation COC concentrations within the solidified areas and therefore greatly over-stated mass flux estimates that contribute to downgradient MCL exceedances and longer restoration timeframes.*	While the solidified block may not be considered by the EPA as "aquifer material", it nonetheless is saturated with contaminated porewater in contact with DNAPL. The groundwater model correctly reflects this condition. The EPA does not provide any explanation as to why or authority to support its statement that groundwater in intimate contact with DNAPL within the solidified block would have lower COC concentrations than present groundwater conditions.	In the December 3, 2014 meeting, EPA committed to review this comment again. The Respondents may remove the portion of the text that states: *"EPA does not considered the solidified block as aquifer material; however the model assumes no change in groundwater concentrations in the block as a result of the solidification. This assumption most likely yields greatly over-stated initial post-remediation COC concentrations within the solidified areas and therefore greatly over-stated mass flux estimates that contribute to downgradient MCL exceedances and longer restoration timeframes."*	Indicated portion of text has been removed in accordance with EPA's July 2015 response. In addition, 'de minimis' has been revised to 'small'.
45	*Section 7.1.1.2* *Residuals from potentially not addressing every occurrence of DNAPL.*	• *Although the lateral and vertical extent of PTW remediation in both the upland and aquatic areas of the Site will be based on a field performance standard (to be determined during remedial design), small volumes and masses of DNAPL residuals could be inadvertently missed during remedy implementation. DNAPL residuals would most likely be in very thin laterally discontinuous sand stringers within the Shallow Aquifer bounded by relatively impermeable silts/clay making them very low strength groundwater contamination sources. Naphthalene and benzene mass and thus groundwater concentrations would decay over time based on their half-lives. Benzo(a)pyrene would essentially not decay and would remain essentially immobile and not significantly contribute to dissolved groundwater contamination.* *It is expected that best management practices would be used during remedy construction to address these issues related to residuals.*	Given the complex distribution of DNAPL at the Site, we agree that it is highly likely that DNAPL residuals will result under any alternative. While we believe that portions of the DNAPL source can be reliably contained, even small amounts of DNAPL remaining will persist and contribute to localized groundwater contamination in perpetuity. EPA states that it expects that BMPs will address these occurrences but provides no information on the BMPs to be used or to what degree they would address residuals. Regardless of the BMPs used during the remedy, residuals will remain and will be a source to contamination to groundwater in perpetuity.	In the December 3, 2014 meeting, EPA committed to review this comment again. Upon further review, the Respondents may remove the portion of the bullet that says: *"Naphthalene and benzene mass and thus groundwater concentrations would decay over time based on their half-lives. Benzo(a)pyrene would essentially not decay and would remain essentially immobile and not significantly contribute to dissolved groundwater contamination."* The last sentence about BMPs (after the bullet) may also be revised to: *"It is expected that issues related to residuals will be addressed during remedial design, treatability testing, and*	Clarification has been added that residuals will be managed during remedial design, etc. and that residuals are expected to remain regardless of BMPs implemented.

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				remedial construction, in order to adequately characterize the nature and extent of DNAPL and maximize the effectiveness of removal and/or treatment technologies ."	
46	*Section 7.3.3.2 Adequacy and Reliability of Controls*	***RCM Caps.*** *The adequacy and reliability of RCM caps is difficult to predict because the technology is relatively new. There is little field information about long-term effectiveness and reliability of RCM caps. There is no field information about how RCM placement and replacement/repair may affect the long-term viability of the RCM caps. The lack of long-term field experience and the need for treatability/pilot studies is a significant concern about the reliability of a technology that will be required in perpetuity. There is considerable debris on and in the surface sediments at Quendall that may cause problems with RCM integrity unless the sediment is sufficiently cleared of debris. The shoreline bathymetry would be required to be maintained, which may limit repair and replacement options. RCM caps may lose their effectiveness when the reactive material becomes saturated or damaged.*	See PRP Response Nos. 7 and 16 to EPA Comment Items 3.a.iii and 12.	See EPA's response to PRP Response Nos. 7 and 16. Respondents may revise discussion of RCM caps in Section 7.3.3.2 in the context that RCM caps could still be used for alternatives that proposed them for T-Dock sediment. As noted earlier, amended sand caps will be included for alternatives that proposed RCMs in the nearshore area. EPA will review revisions prior to finalizing the FS.	See response to EPA comment #3.a.iii
47	*Section 7.3.6.1 Technical Feasibility*	*There is little field experience with the general use of RCM caps and especially, there is no field information/experience regarding the long-term use and long-term efficacy of RCM caps. There is no information about the expected longevity of RCM caps nor is there much experience with repairing/replacing RCMs when they become ineffective. Unusual technical challenges are expected when RCM caps are placed and repaired or replaced in the aquatic environment because they have only been in use for a short period of time*	See PRP Response Nos. 7 and 16 to EPA Comment Items 3.a.iii and 12.	See EPA's response to PRP Response Nos. 7 and 16. Respondents may revise discussion of RCM caps in Section 7.3.6.1 in the context that RCM caps could still be used for alternatives that proposed them for T-Dock sediment. EPA will review revisions prior to finalizing the FS.	See response to EPA comment #3.a.iii
48	*Section 7, General*	Balancing Criteria Ratings	We disagree with the rating of alternatives that the EPA has assigned for the following NCP criteria: 'Low' for Long-Term Effectiveness of Alternatives 4 and 4a.	EPA has reviewed the Respondents' rationale for proposed ranking changes and agrees to the following: 'Low' for Long-Term Effectiveness of Alternatives 4 and 4a.	Ranking changes have been made in accordance with EPA's July 2015 responses.

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			'Low' for Implementability of Alternative 3. 'Moderate' for Short-term effectiveness and Implementability of Alternative 4a. 'Moderate' for short-term effectiveness of Alternative 7. 'High' for implementability of Alternative 7.	*EPA accepts the proposed change from 'low' to 'moderate' for these alternatives, given the change from RCM caps to amended sand caps in the nearshore.* 'Low' for Implementability of Alternative 3. *EPA will accept a change from 'low' to 'moderate' (not 'low' to 'high' as proposed) based on the rationale given, particularly with the change from RCM caps to amended sand caps in the nearshore.* 'Moderate' for Short-term effectiveness and Implementability of Alternative 4a. *EPA accepts the proposed change from 'moderate' to 'high' for rating.* 'Moderate' for short-term effectiveness of Alternative 7. *EPA rejects the proposed change from 'moderate' to 'low' for this rating. While the in-water construction activities for Alternative 7 are more extensive than Alternative 6, the upland activities are similar. Alternatives 8 through 10 include similar to more extensive in-water work, as well as more extensive upland construction, and should be distinguished as rating lower than Alternative 7.* 'High' for implementability of Alternative 7.	

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				EPA accepts the proposed change from 'high' to 'moderate' for this rating.	